Sandford, S., Ennico, K., Allamandola, L., Bregman, J., Greene, T., Hudgins, D. (2002). (abstract) The AstroBiology Explorer (ABE) MIDEX Mission Concept: Using Infrared Spectroscopy to Identify Organic Molecules in Space. Astrobiology Science Conference 2002, NASA-Ames Research Center, Moffett Field, CA, 7-11 April 2002.

Conference: Astrobiology Science Conference 2 (7-11 April 2002)

The AstroBiology Explorer (ABE) MIDEX Mission Concept: Using Infrared Spectroscopy to Identify Organic Molecules in Space

Scott A. Sandford (NASA-Ames Research Center)
Kimberly Ennico(NASA-Ames Research Center)
**Louis Allamandola (NASA-Ames Research Center)
Jesse Bregman (NASA-Ames Research Center)
Thomas Greene(NASA-Ames Research Center)
Douglas Hudgins(NASA-Ames Research Center)

**submitted as presenter

Category: Astrobiology Missions

Abstract:

One of the principal means by which organic compounds are detected and identified in space is by infrared spectroscopy. Past IR telescopic and laboratory studies have shown that much of the carbon in the interstellar medium (ISM) is in complex organic species, but the distribution, abundance, and evolutionary relationships of these materials are not well understood. The Astrobiology Explorer (ABE) is a MIDEX mission concept designed to conduct IR spectroscopic observations to detect and identify these materials and address outstanding problems in astrobiology, astrochemistry, and astrophysics. ABE's core science program includes observations of planetary nebulae and stellar outflows, protostellar objects, Solar System objects, and galaxies, and lines of sight through dense molecular clouds and the diffuse ISM. ABE is a cryogenically-cooled 60 cm diameter space telescope equipped with 3 cross-dispersed R~2000 spectrometers that share a single common slit. Each spectrometer measures one spectral octave and together cover the entire 2.5-20 micron region simultaneously. The spectrometers use state-of-the-art InSb and Si:As 1024x1024 pixel detectors. ABE would operate in a heliocentric, Earth drift-away orbit and have a core science mission lasting ~1.5 years. ABE is currently under study at NASA's Ames Research Center in collaboration with Ball Aerospace and Technologies Corp.